

02535

MANHOLES

LANL MASTER CONSTRUCTION SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the ESM Civil POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

Specification developed for ML-3/ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

PART 1 GENERAL

Refer to LANL Standard Civil Drawing ST-G3030-3 for storm water manhole detail and Drawing ST-G3030-1 for sanitary sewer manhole detail.

1.1 SECTION INCLUDES

- A. Precast concrete manhole sections and manhole frame and cover castings for use in [sanitary sewer and storm water] systems.

1.2 SUBMITTALS

- A. Alternate products may be accepted: Follow Section 01330, Submittal Procedures:
 - 1. Certifications: Furnish copies of materials certificates certifying that each material item complies with, or exceeds, specified requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide precast concrete manhole sections (base barrel sections, risers and conical/eccentric tops, flat slab tops, grade rings, etc.) per ASTM C478.
 - 1. Concrete: Compressive strength of 4000 psi for 28 days.

B. Manhole Frame and Cover

1. Provide castings true to patterns in form and dimension, and free from pouring faults, sponginess, cracks, blowholes, or other defects in locations affecting their strength and value for the service intended. Provide castings with fillets at angles with sharp and true risers.
2. Provide castings conforming to ASTM A48, Class 30B.
 - a. Machine or grind bearing surfaces of the frames and covers to furnish a uniform, flat, non-rocking seat for the cover on the frame.
 - b. Provide cover with the word "Sewer" cast on the sewer manhole cover.
 - c. Provide cover with the word "Storm Drain" cast on the storm water manhole cover.

C. Sealing Gasket (precast manhole sections): Mastic Gasket as manufactured by RAM-NEK or Kent Seal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Compact soil foundations for manhole base to density of 95 percent of the maximum density per ASTM D 1557. Compaction shall be minimum 1 foot beyond perimeter of concrete base and shall be a minimum of 1 foot in depth.
- B. Invert elevation of pipes entering or exiting manhole and interior inverts shall not vary more than 0.05 foot from the elevations.
- C. Use 4,000 psi at 28 days concrete for formed-in-place foundations or bases, concrete shelves, pipe supports, and concrete fill.
- D. Depending on size of pipe, make connections to existing and new manholes by either core drilling through manhole wall (perform for new precast units), or carefully chipping wall segment. Take care to avoid unnecessary damage to manhole surfaces or walls.
- E. Provide waterstop before placing non-shrink grout in manhole wall around piping. Coat interior surface of manhole to provide watertight seal.
- F. Seal grade ring and cover with mastic and/or grout to provide watertight seal and the prevention of displacement of rings.

3.2 MANHOLES

- A. The vertical riser sections of manhole may be of different dimensions in order that manholes of various depths can be readily assembled.

- B. Install circular precast manhole sections with sealing gasket to seal joints between sections. Clean joints prior to installation.
- C. Fill lifting holes and gaps at joints with a nonshrink grout.
- D. Precast concrete manhole bases may be used when approved by LANL's Utility Group wastewater system representative. If approved, it is with the understanding that placing the bases at the specified elevation, location, and alignment is the Contractor's responsibility.

3.3 GRADE RINGS

- A. Use mastic and/or grout to lay grade rings.
- B. Grade rings shall remain plumb and vertically aligned during backfilling and paving operations.

3.4 MANHOLE FRAME AND COVER

- A. Provide ductile iron castings as shown on the Drawings and as specified herein. The castings shall include manhole frames and covers.

3.5 TESTING OF SEWER MANHOLES

- A. Test sanitary sewer manholes for leakage by a water exfiltration test. Submit test reports to the LANL Construction Inspector. Perform test prior to backfilling around manhole and prior to placement of manhole frame and cover. Properly plug inlet and outlet lines and fill and seal lift holes and barrel joints as specified. In lieu of water exfiltration testing the manhole interior can be coated with a two part, high build epoxy lining with 100% solids by volume. Material shall have chemical resistance and be designed as a structural lining for manholes and vessels in wastewater facilities. Preparation of surface and application of product shall be per the manufacturer's instructions.

1. Manufacturer: Raven Lining Systems.

- B. Furnish all materials and equipment necessary to perform test and conduct test in the presence of the LANL Construction Inspector. Allow a stabilization period of 1 hour for absorption, after which, refill manhole as necessary before starting test. Perform test for a period of 2 hours, after which refill manhole, measuring necessary quantity of water. The difference in water surface elevation from original to final level shall be measured and converted to gallons per hour lost through manhole leakage. An allowable leakage is allowed and is represented by the following formula:

V =	0.20 DHT
Where: V =	Allowable loss in gallons
D =	Manhole diameter in feet
H =	Initial depth of water to invert in feet
T =	Duration of test in hours

END OF SECTION

Do not delete the following reference information:

FOR LANL USE ONLY

This project specification is based on LANL Master Construction Specification Rev. 1, dated September 2, 2004.